

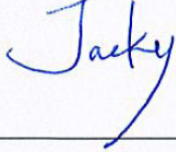


LITEMAX
SSD3840-V2
Local Dimming
Spanpixel

Sunlight Readable 38" LCD Display

(1st Edition 4/24/2013)

All information is subject to change without notice.

Approved by	Checked by	Prepared by
		

LITEMAX Electronics Inc.
7F, No.137, Lane 235, Bau-Chiau Rd.,
Xindian Disty, New Taipei City, Taiwan R.O.C.
Tel : 886-2-8919-1858
Fax: 886-2-8919-1300
Homepage: <http://www.litemax.com/>

RECORD OF REVISION

Version	Date	Description	Remark
V1.0	Apr/19/2013	Initial Release	

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1.0 GENERAL DESCRIPTION

OVERVIEW

The SSD3840-V2 is a 38 inch color TFT-LCD display with special aspect ratio 16:4.2 and wide resolution 1920 x 502 (1920 horizontal by 502 vertical pixel array). It is Litemax's Spanpixel series product which designed for high brightness 2000 nits display, power efficiency LED backlight system and fanless display. The SSD3840-V2 build in AD board supports input ports VGA and DVI-D, optional ports are component (YCbCr), composite (AV) and S-video input.

Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes. Gray scale or the brightness of the sub-pixel color is determined with 8-bit gray scale signal for each dot. It is intended to support display where wide viewing angle, high color saturation, and high color depth.

FEATURES

- Resizing LCD
- Ultra Wide Screen (16 : 4.2)
- Sunlight Readable
- LED Backlight
- Ultra High Brightness 2000 nits
- Local Dimming
- Low Power Consumption
- Wide Dimming

Slim Bezel Slim Bezel APPLICATION

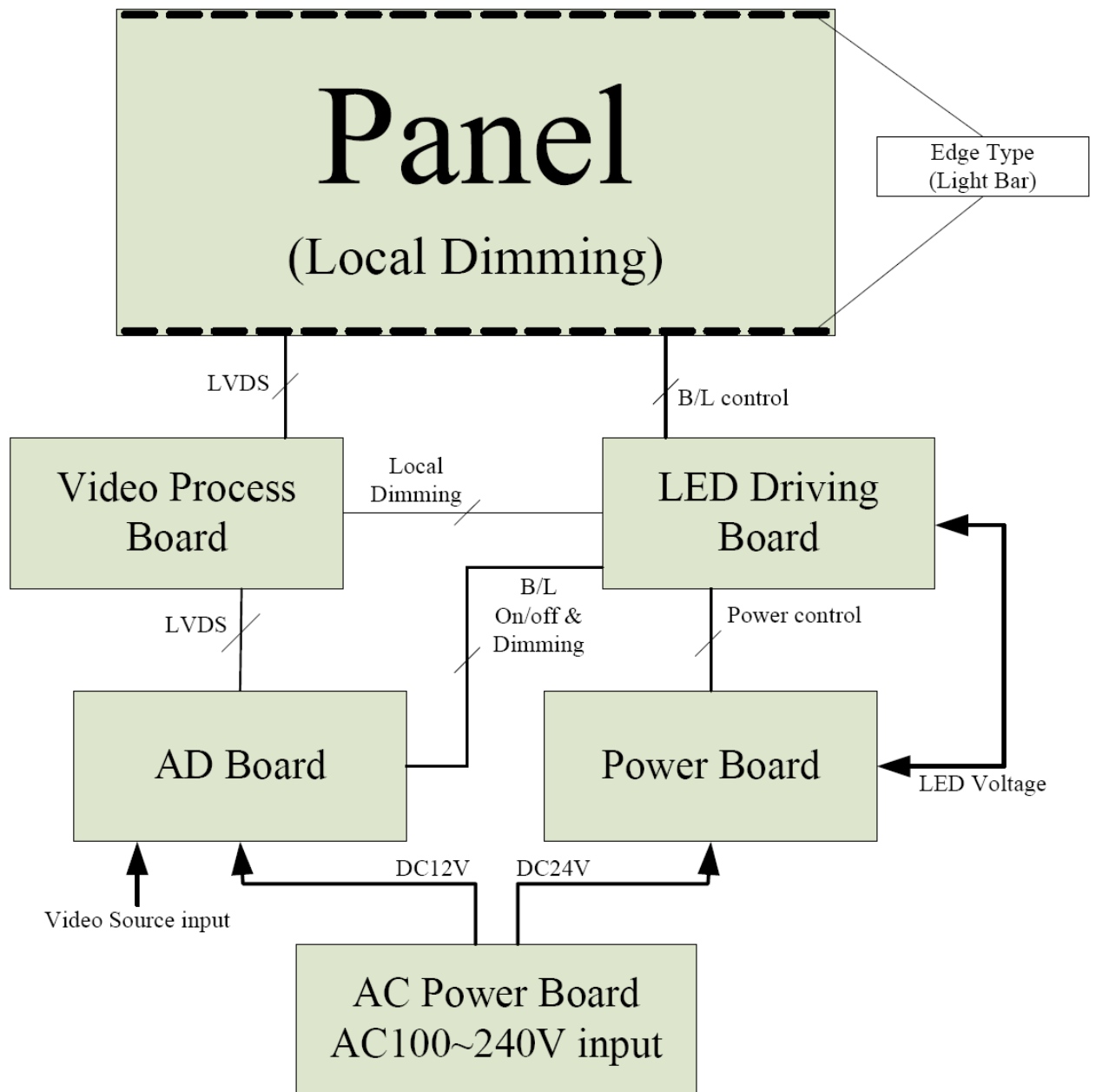
- Out/Indoor Display
- Out/Indoor Digital Signage
- Quick Service Restaurant Display Product
- Transportation

GENERAL SPECIFICATIONS

Model No.	SSD3840-V2
LCD Display	38" Resizing LCD, Local Dimming Display
Display Area (mm)	930.2 (H) x 243.2 (V)
Display Surface	Anti-Glare hard coated
Luminance	2000 cd/m ²
Resolution	1920 x 502
Contrast Ratio	5600 : 1 (Typ)
Display Colors	16.7M colors
Pixel Arrangement	RGB (Red, Green, Blue) vertical stripe
Pixel Pitch (mm)	0.4845 x 0.4845 mm
Response Time	6.5ms (Typ.)
Signal Connector	15 Pin D-sub, 29 Pin DVI
F/R Control Button	Power Switch, Menu, Select (+,-)
OSD Menu	Brightness, Contrast, H/V Position, Color, Phase, Clock, Language, Management
Power Consumption	Black (100%) => 23W, White (100%)=> 130W Black (50%) & White (50%)=> 75W
Option	Touch for customize (Resistive/ Capacitive)

※ Specifications subject to change without notice.
SSD= Panel+ LED Driving Board + Control Board

LOCAL DIMMING BLOCK DIAGRAM



2.0 ABSOLUTE MAXIMUM RATINGS

ABSOLUTE RATINGS OF ENVIRONMENT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	T_{ST}	-20	+60	°C	(1)
Operating Ambient Temperature	T_{OP}	0	50	°C	(1), (2)
Shock (Non-Operating)	S_{NOP}	$\pm X, \pm Y$	30	G	(3), (5)
		$\pm Z$	30		
Vibration (Non-Operating)	V_{NOP}	-	1.0	G	(4), (5)

Note (1) Temperature and relative humidity range is shown in the figure below.

(a) 90 %RH Max. ($T_a \leq 40$ °C).

(b) Wet-bulb temperature should be 39 °C Max. ($T_a > 40$ °C).

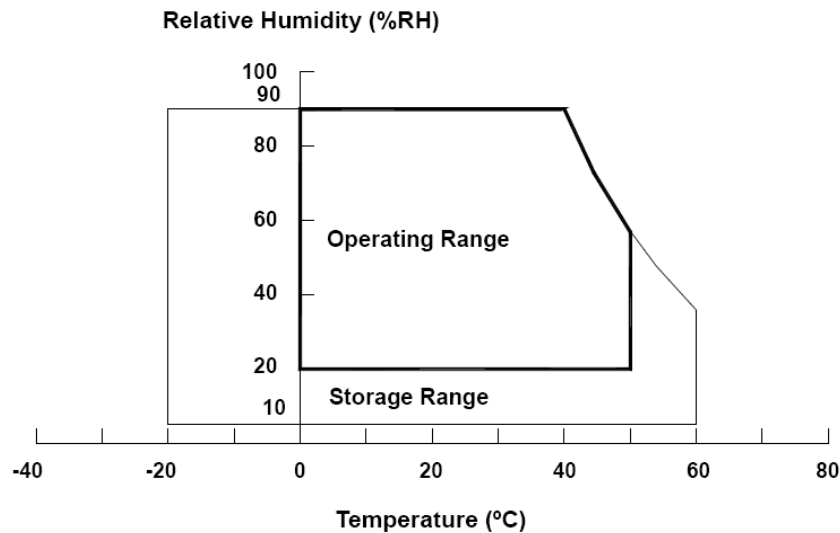
(c) No condensation.

Note (2) The maximum operating temperature is based on the test condition that the surface temperature of display area is less than or equal to 65 °C with LCD module alone in a temperature controlled chamber. Thermal management should be considered in final product design to prevent the surface temperature of display area from being over 65 °C. The range of operating temperature may degrade in case of improper thermal management in final product design.

Note (3) 11 ms, half sine wave, 1 time for $\pm X, \pm Y, \pm Z$.

Note (4) 10 ~ 200 Hz, 10 min, 1 time each X, Y, Z.

Note (5) At testing Vibration and Shock, the fixture in holding the module has to be hard and rigid enough so that the module would not be twisted or bent by the fixture.



ELECTRICAL ABSOLUTE RATINGS

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Power Supply Voltage	VCC	-0.3	13.5	V	(1)
Logic Input Voltage	VIN	-0.3	3.6	V	

Note (1) Permanent damage to the device may occur if maximum values are exceeded. Function operation should be restricted to the conditions described under Normal Operating Conditions.

3.0 ELECTRICAL CHARACTERISTICS

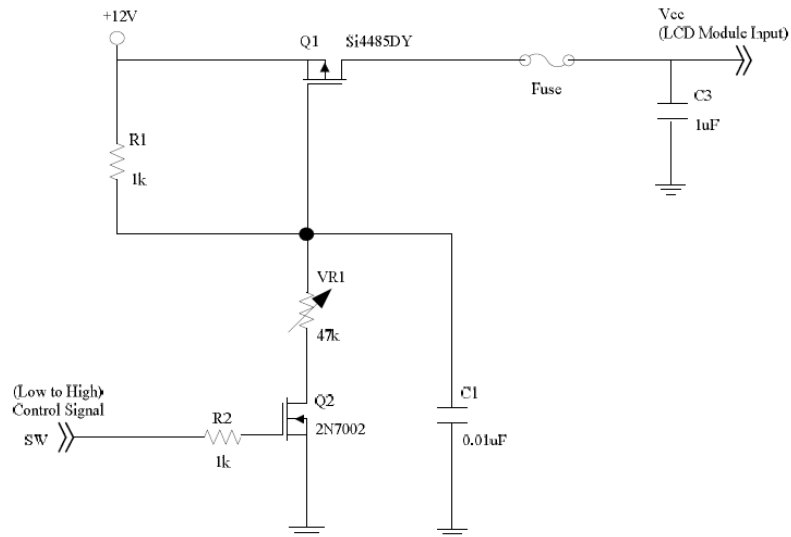
TFT LCD MODULE

(Ta = 25 ± 2 °C)

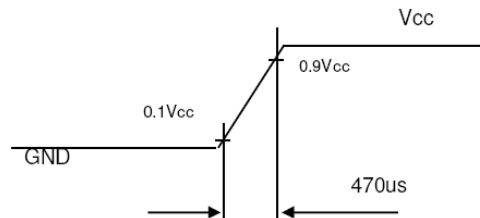
Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power Supply Voltage		V _{CC}	10.8	12	13.2	V	(1)
Rush Current		I _{RUSH}	—	—	3.5	A	(2)
Power Supply Current	White Pattern	—	—	0.98	—	A	(3)
	Horizontal Stripe	—	—	0.98	1.2	A	
	Black Pattern	—	—	0.51	—	A	
LVDS interface	Differential Input High Threshold Voltage	V _{LVTH}	+100	—	—	mV	(4)
	Differential Input Low Threshold Voltage	V _{LVTL}	—	—	-100	mV	
	Common Input Voltage	V _{CM}	1.0	1.2	1.4	V	
	Differential input voltage	V _{ID}	200	—	600	mV	
	Terminating Resistor	R _T	—	100	—	ohm	
CMOS interface	Input High Threshold Voltage	V _{IH}	2.7	—	3.3	V	
	Input Low Threshold Voltage	V _{IL}	0	—	0.7	V	

Note (1) The module should be always operated within the above ranges.

Note (2) Measurement condition:



Vcc rising time is 470us



Note (3) The specified power supply current is under the conditions at $V_{cc} = 12\text{ V}$, $T_a = 25 \pm 2\text{ }^{\circ}\text{C}$, $f_v = 60\text{ Hz}$, whereas a power dissipation check pattern below is displayed.

a. White Pattern

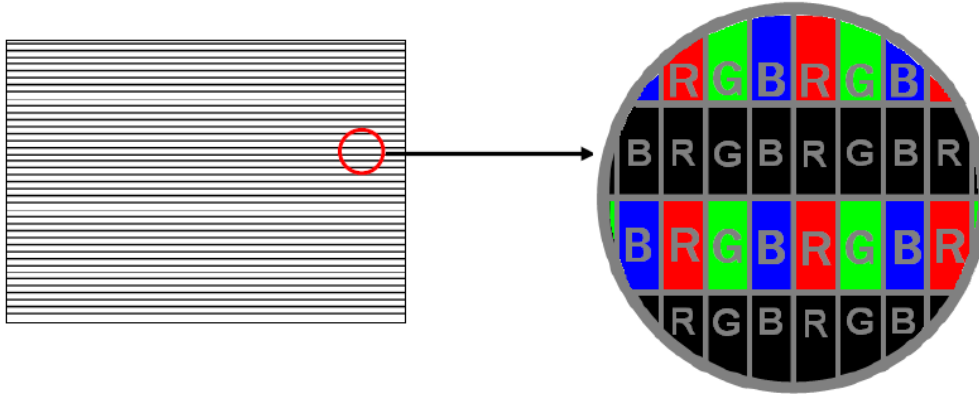


Active Area

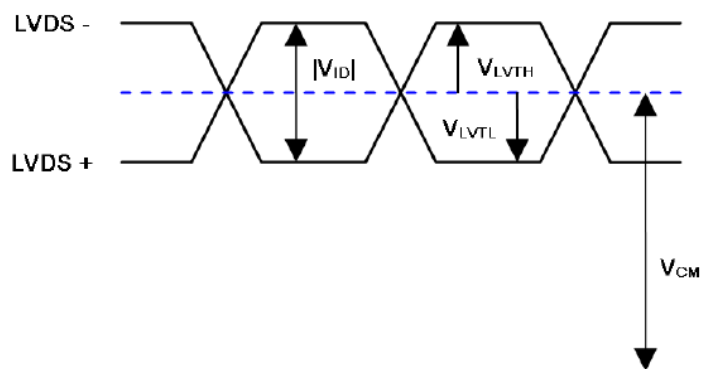
b. Black Pattern



Active Area



Note (4) The LVDS input characteristics are as follows:



LED Driving Board

Operating Characteristics

Item	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Remark
Input Voltage	Vin		22.8	24	25.2	V	DC
Input Current (Low Brightness)	IinL		0.014	0.014	0.014	A	
Input Current (High Brightness)	IinH		4.507	4.264	4.054	A	
LED Current (Low Brightness)	IoutL		0	-----	-----	mA	
LED Current (High Brightness)	IoutH		2.848	2.848	2.848	A	Total :32CH
Working Frequency	Freq	POWER BOARD		205		KHZ	
LID VSYNC	Freq		-----	---120	-----	HZ	
Brightness	Vadj	Connection of Voltage	0	-----	5	V	DC
ON/OFF Control	Von/off	Normal Operation	2.5	-----	5	V	DC
Output Voltage	Vout	VIN=24V, Vadj=3.3V	35	35.1	35.033	V	DC
Efficiency	η	VIN=24V, Brightness=20	97	97	97	%	Note 1

Note 1:Efficiency= $[(I_{outH} * V_{out}) / (I_{inH} * V_{in})] * 100\%$, Tolerance $\pm 0.5\%$

Environment

Operation Temperature	-20 ~ 85°C	
Operation Humidity	83.79% Max.RH	Note: Examine CONVERTER & LED efficiency for 16 hours under 25 degrees.
Storage Temperature	-40 ~ 85°C	
Storage Humidity	83.79% Max.RH	Note: Examine CONVERTER & LED efficiency for 16 hours under 25 degrees.

POWER BOARD

CON1: JST S10B-PH-SM3-TB or Compatible

PIN No	Symbol	Description
1	Vin	DC+24V
2	Vin	DC+24V
3	Vin	DC+24V
4	Vin	DC+24V
5	Vin	DC+24V
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	GND	Ground
10	GND	Ground

J1: JST S8B-PH-SM3-TB or Compatible

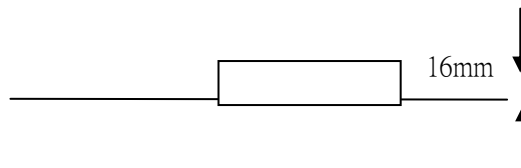
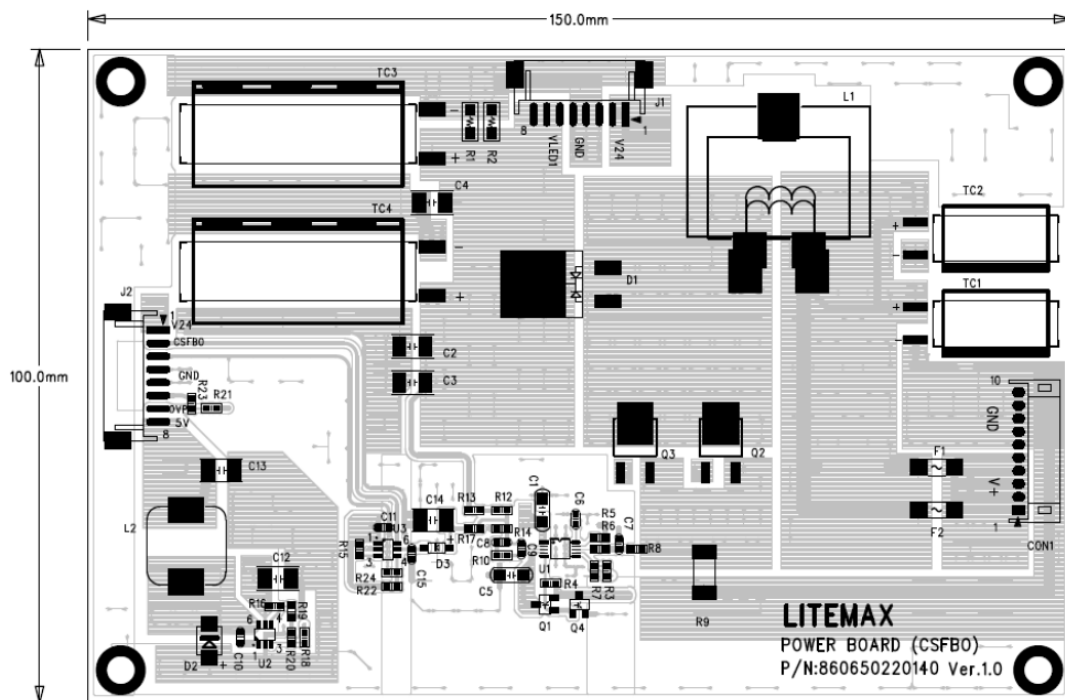
PIN No	Symbol	Description
1	POWER	Vin output
2	POWER	Vin output
3	GND	Ground
4	GND	Ground
5	GND	Ground
6	VLED	Backlight LED Voltage
7	VLED	Backlight LED Voltage
8	VLED	Backlight LED Voltage

J2: JST S8B-PH-SM3-TB or Compatible

PIN No	Symbol	Description
1	POWER	Vin output
2	SINGLE	CSFBO INPUT SINGLE
3	GND	Ground
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	SINGLE	OVP SINGLE OUTPUT
8	POWER	5V OUTPUT

Mechanical Characteristics

Dimension: 150mm*100mm*16mm



MAIN BOARD

J1 RECORD MCU: 1.25mm, 5P

PIN No	Symbol	Description
1	SINGLE	MCLR
2	POWER	3.3V
3	GND	Ground
4	SINGLE	PGD
5	SINGLE	PGC

J2 I2C: 1.25mm

PIN No	Symbol	Description
1	POWER	3.3V
2	GND	Ground
3	SINGLE	SCL1
4	SINGLE	SDA1

J3 TO AD BOARD:2.0mm

PIN No	Symbol	Description
1	GND	GND
2	SINGLE	Dimming
3	SINGLE	ON/OFF
4	SINGLE	IO PIN
5	SINGLE	IO PIN

J4 SPI INTERFACE: 1.25mm

PIN No	Symbol	Description
1	GND	GND
2	SINGLE	VSYNC
3	GND	GND
4	SINGLE	DIN
5	GND	GND
6	SINGLE	DCLK
7	GND	GND
8	SINGLE	CS
9	GND	GND

J5 2.0mm 4p

PIN No	Symbol	Description
1	VCC	5V
2	GND	Ground
3	SINGLE	FBOUT
4	GND	Ground

J6 TO BACKLIGHT:1.0mm

PIN No	Symbol	Description
1	VCC	VLED
2	VCC	VLED
3	RETURN	CS8
4	RETURN	CS7
5	RETURN	CS6
6	RETURN	CS5
7	RETURN	CS4
8	RETURN	CS3
9	RETURN	CS2
10	RETURN	CS1

J7 TO BACKLIGHT:1.0mm

PIN No	Symbol	Description
1	RETURN	CS9
2	RETURN	CS10
3	RETURN	CS11
4	RETURN	CS12
5	RETURN	CS13
6	RETURN	CS14
7	RETURN	CS15
8	RETURN	CS16
9	VCC	VLED
10	VCC	VLED

J8 TO BACKLIGHT:1.0mm

PIN No	Symbol	Description
1	VCC	VLED
2	VCC	VLED
3	RETURN	CS24
4	RETURN	CS23
5	RETURN	CS22
6	RETURN	CS21
7	RETURN	CS20
8	RETURN	CS19
9	RETURN	CS18
10	RETURN	CS17

J9 TO BACKLIGHT:1.0mm

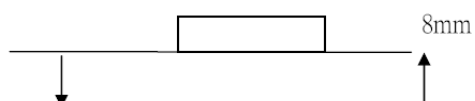
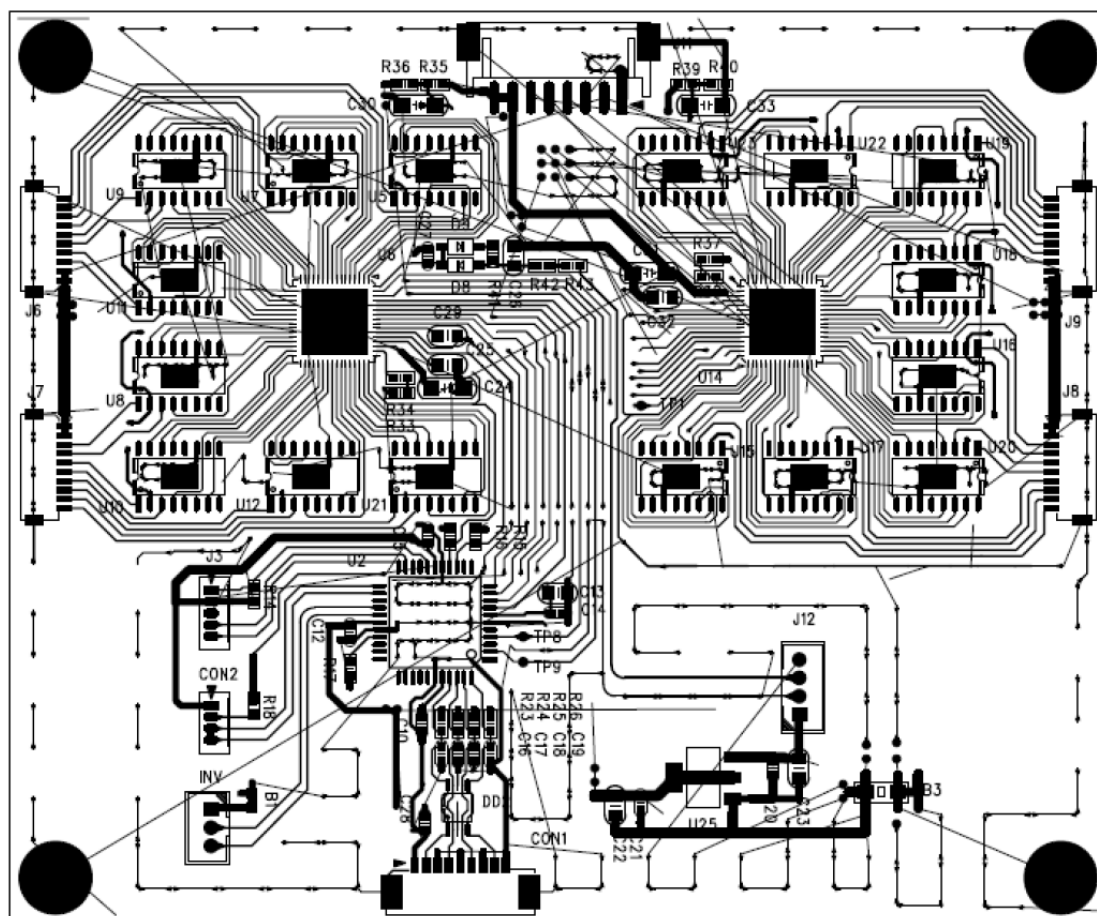
PIN No	Symbol	Description
1	RETURN	CS25
2	RETURN	CS26
3	RETURN	CS27
4	RETURN	CS28
5	RETURN	CS29
6	RETURN	CS30
7	RETURN	CS31
8	RETURN	CS32
9	VCC	VLED
10	VCC	VLED

J10 TO POWER BOARD:JST S8B-PH-SM3-TB or Compatible

PIN No	Symbol	Description
1	VCC	VLED
2	VCC	VLED
3	VCC	VLED
4	GND	GND
5	GND	GND
6	GND	GND
7	VCC	24V
8	VCC	24V

Mechanical Characteristics

Dimension: 120mm*100mm*8mm

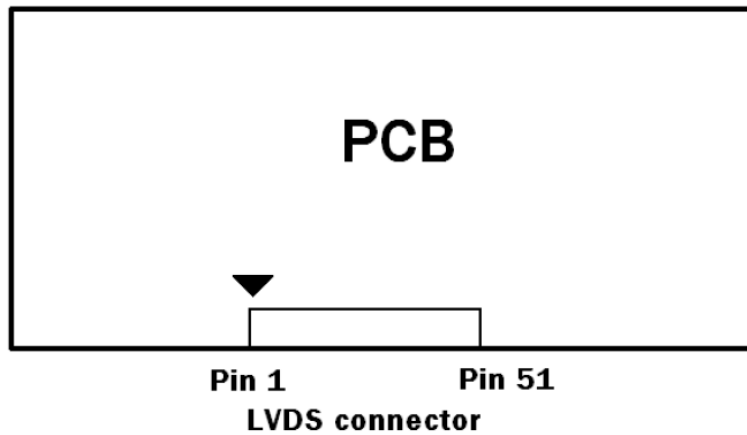


4.0 INPUT TERMINAL PIN ASSIGNMENT

TFT LCD MODULE

Pin	Name	Description	Note
1	GND	Ground	
2	SCL	Series clock input	
3	SDA	Series data input	
4	N.C.	No Connection	(2)
5	N.C.	No Connection	
6	N.C.	No Connection	
7	SELLVDS	LVDS data format Selection	(3)(5)
8	N.C.	No Connection	(2)
9	ODSEL	Overdrive Lookup Table Selection	(4)(6)
10	TST_PGM	Write protect input	
11	GND	Ground	
12	ERX0-	Even pixel Negative LVDS differential data input. Channel 0	(7)
13	ERX0+	Even pixel Positive LVDS differential data input. Channel 0	
14	ERX1-	Even pixel Negative LVDS differential data input. Channel 1	
15	ERX1+	Even pixel Positive LVDS differential data input. Channel 1	
16	ERX2-	Even pixel Negative LVDS differential data input. Channel 2	
17	ERX2+	Even pixel Positive LVDS differential data input. Channel 2	
18	GND	Ground	
19	ECLK-	Even pixel Negative LVDS differential clock input	(7)
20	ECLK+	Even pixel Positive LVDS differential clock input	
21	GND	Ground	
22	ERX3-	Even pixel Negative LVDS differential data input. Channel 3	(7)
23	ERX3+	Even pixel Positive LVDS differential data input. Channel 3	
24	N.C.	No Connection	(2)
25	N.C.	No Connection	
26	GND	Ground	
27	GND	Ground	
28	ORX0-	Odd pixel Negative LVDS differential data input. Channel 0	(7)
29	ORX0+	Odd pixel Positive LVDS differential data input. Channel 0	
30	ORX1-	Odd pixel Negative LVDS differential data input. Channel 1	
31	ORX1+	Odd pixel Positive LVDS differential data input. Channel 1	
32	ORX2-	Odd pixel Negative LVDS differential data input. Channel 2	
33	ORX2+	Odd pixel Positive LVDS differential data input. Channel 2	
34	GND	Ground	
35	OCLK-	Odd pixel Negative LVDS differential clock input.	(7)
36	OCLK+	Odd pixel Positive LVDS differential clock input.	
37	GND	Ground	
38	ORX3-	Odd pixel Negative LVDS differential data input. Channel 3	(7)
39	ORX3+	Odd pixel Positive LVDS differential data input. Channel 3	
40	N.C.	No Connection	(2)
41	N.C.	No Connection	
42	GND	Ground	
43	GND	Ground	
44	GND	Ground	
45	GND	Ground	
46	GND	Ground	
47	N.C.	No Connection	(2)
48	VCC	+12V power supply	
49	VCC	+12V power supply	
50	VCC	+12V power supply	
51	VCC	+12V power supply	

Note (1) LVDS connector pin order defined as follows



Note (2) Reserved for internal use. Please leave it open.

Note (3) Low = Open or connect to GND: VESA Format, High = Connect to +3.3V: JEIDA Format.

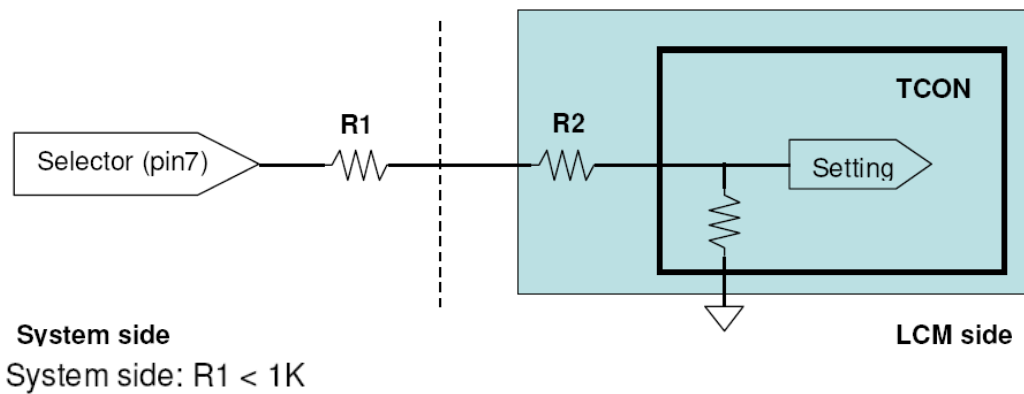
Note (4) Overdrive lookup table selection. The overdrive lookup table should be selected in accordance with the frame rate to optimize image quality.

Low = Open or connect to GND, High = Connect to +3.3V

ODSEL	Note
L or open	Lookup table was optimized for 60 Hz frame rate.
H	Lookup table was optimized for 50 Hz frame rate.

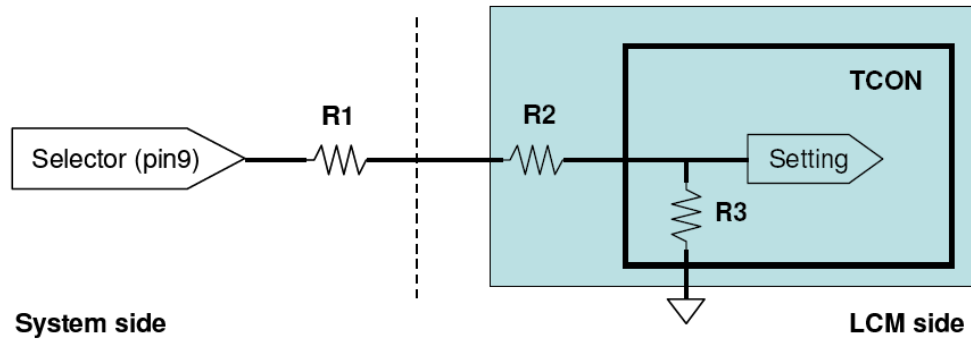
Note (5) LVDS signal pin connected to the LCM side has the following diagram.

R1 in the system side should be less than 1K Ohm. ($R1 < 1K \text{ Ohm}$)



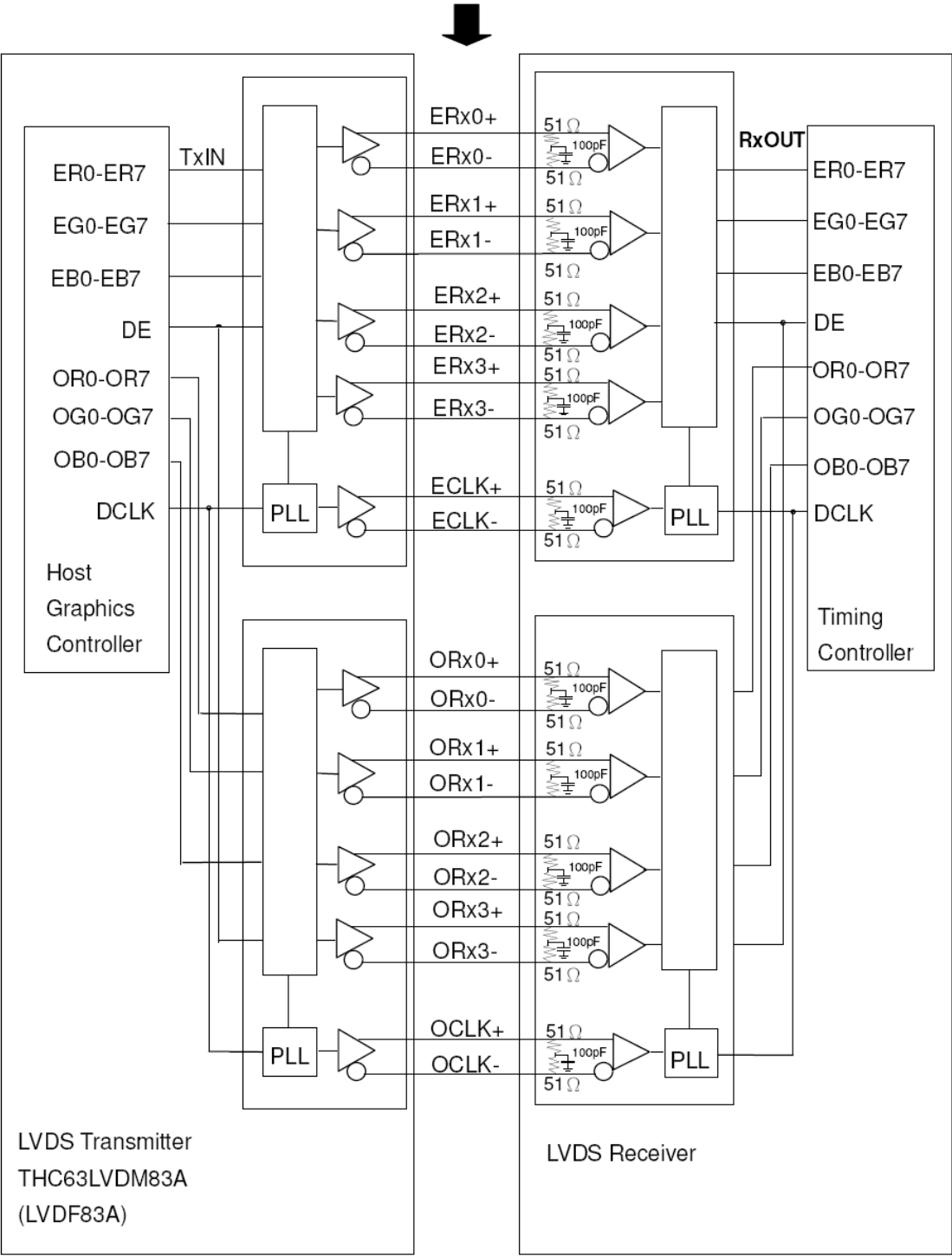
Note (6) ODSEL signal pin connected to the LCM side has the following diagram.

R1 in the system side should be less than 1K Ohm. ($R1 < 1K\ \Omega$)



Note (7) Two pixel data send into the module for every clock cycle. The first pixel of the frame is odd pixel and the second pixel is even pixel.

BLOCK DIAGRAM OF INTERFACE



ER0~ER7: Even pixel R data
 EG0~EG7: Even pixel G data
 EB0~EB7: Even pixel B data
 OR0~OR7: Odd pixel R data
 OG0~OG7: Odd pixel G data
 OB0~OB7: Odd pixel B data
 DE: Data enable signal
 DCLK: Data clock signal

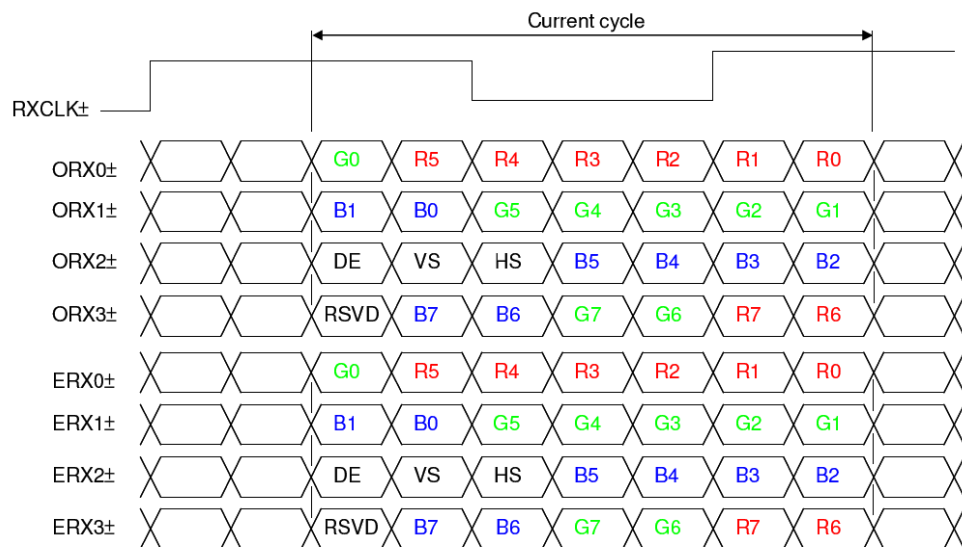
Notes (1) The system must have the transmitter to drive the module.

Notes (2) LVDS cable impedance shall be 50 ohms per signal line or about 100 ohms per twist-pair line when it is used differentially.

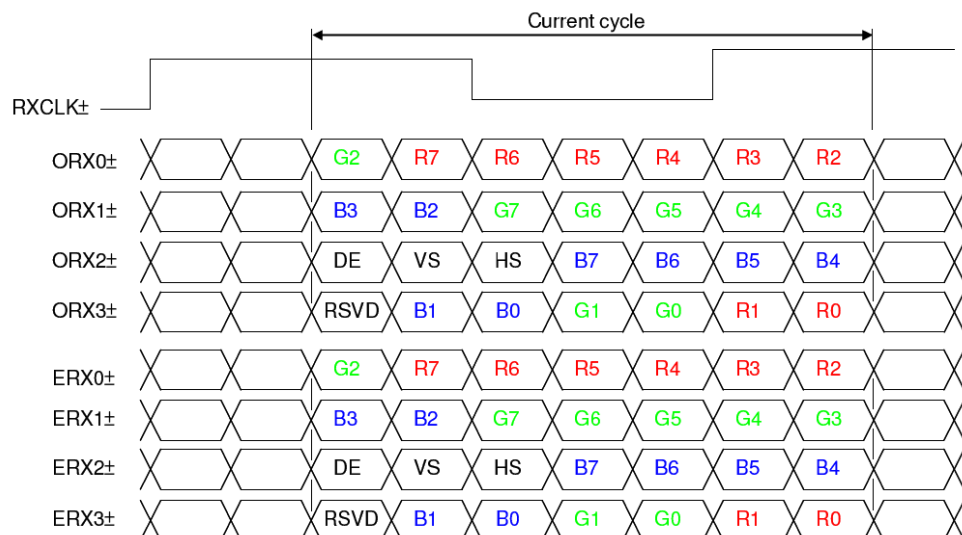
Notes (3) Two pixel data send into the module for every clock cycle. The first pixel of the frame is odd pixel and the second pixel is even pixel.

LVDS INTERFACE

VESA LVDS format : (SELLVDS pin=L)



JEDIA LVDS format : (SELLVDS pin=H)



R0~R7: Pixel R Data (7; MSB, 0; LSB)

G0~G7: Pixel G Data (7; MSB, 0; LSB)

B0~B7: Pixel B Data (7; MSB, 0; LSB)

DE : Data enable signal

DCLK : Data clock signal

Notes: (1) RSVD (reserved) pins on the transmitter shall be "H" or "L".

COLOR DATA INPUT ASSIGNMENT

The brightness of each primary color (red, green and blue) is based on the 8-bit gray scale data input for the color

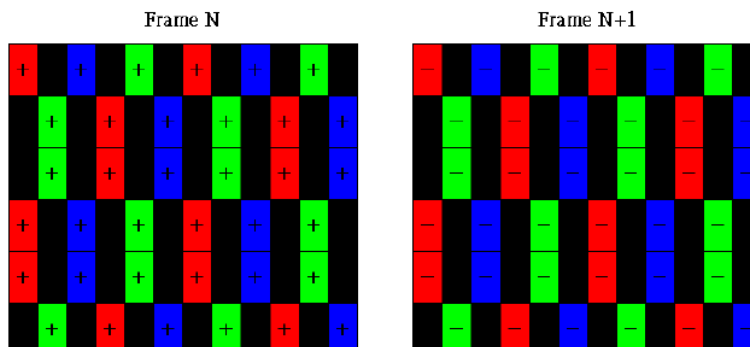
The higher the binary input, the brighter the color. The table below provides the assignment of the color versus data input.

Color		Data Signal																							
		Red								Green								Blue							
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale Of Red	Red (0) / Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red (1)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red (2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Red (253)	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red (254)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red (255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale Of Green	Green (0) / Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Green (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Green (253)	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
	Green (254)	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	Green (255)	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Gray Scale Of Blue	Blue (0) / Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Blue (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue (253)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
	Blue (254)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	Blue (255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

Note (1) 0: Low Level Voltage, 1: High Level Voltage

PATTERN FOR Vcom ADJUSTMENT

2line-inversion pattern (2n+1)



5.0 INTERFACE TIMING

INPUT SIGNAL TIMING SPECIFICATIONS (Ta = 25 ± 2 °C)

The input signal timing specifications are shown as the following table and timing diagram.

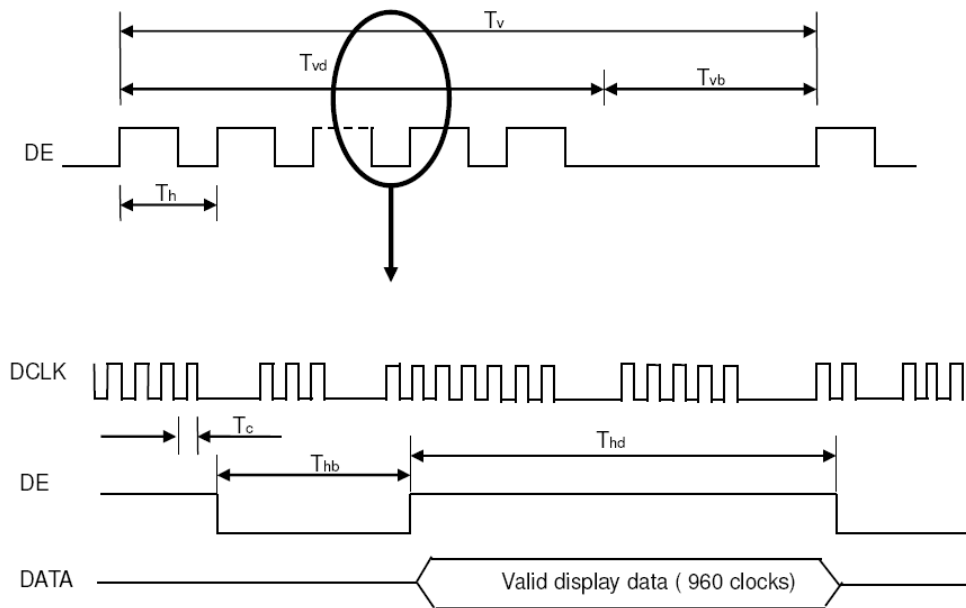
Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
LVDS Receiver Clock	Frequency	$F_{clk_{in}}$ (=1/TC)	60	74.25	80	MHz	
	Input cycle to cycle jitter	T_{rcj}	—	—	200	ps	(3)
	Spread spectrum modulation range	$F_{clk_{in_mod}}$	$F_{clk_{in}}-2\%$	—	$F_{clk_{in}}+2\%$	MHz	(4)
	Spread spectrum modulation frequency	F_{SSM}			200	KHz	
LVDS Receiver Data	Setup Time	T_{lvsu}	600	—	—	ps	(5)
	Hold Time	T_{lvhd}	600	—	—	ps	
Vertical Active Display Term	Frame Rate	F_{r5}	47	50	53	Hz	(6)
		F_{r6}	57	60	63	Hz	
	Total	T_v	1115	1125	1135	Th	$T_v=T_{vd}+T_{vb}$
	Display	T_{vd}	1080	1080	1080	Th	—
	Blank	T_{vb}	35	45	55	Th	—
Horizontal Active Display Term	Total	T_h	1050	1100	1150	Tc	$T_h=T_{hd}+T_{hb}$
	Display	T_{hd}	960	960	960	Tc	—
	Blank	T_{hb}	90	140	190	Tc	—

Note (1) Please make sure the range of pixel clock has follow the below equation :

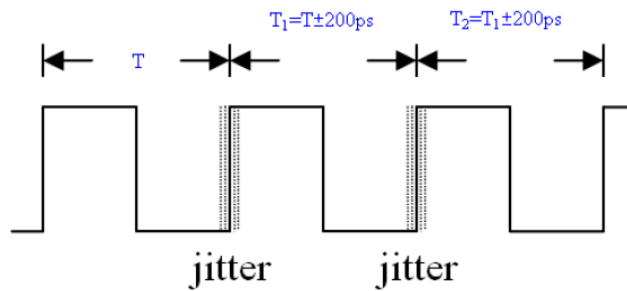
$$F_{clk_{in(max)}} \geq F_{r6} \times T_v \times T_h$$

$$F_{r5} \times T_v \times T_h \geq F_{clk_{in(min)}}$$

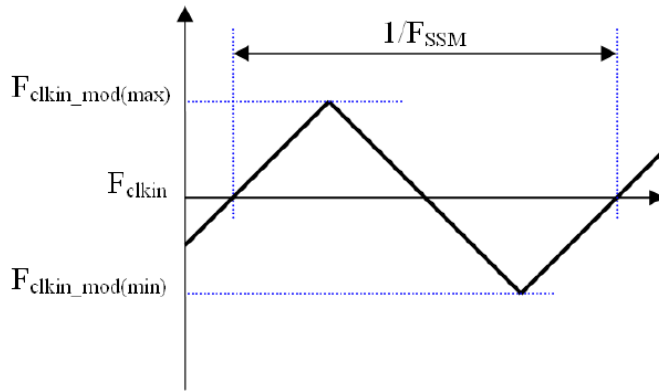
Note (2) This module is operated in DE only mode and please follow the input signal timing diagram below :



Note (3) The input clock cycle-to-cycle jitter is defined as below figures. $Trcl = |T_1 - T_1|$

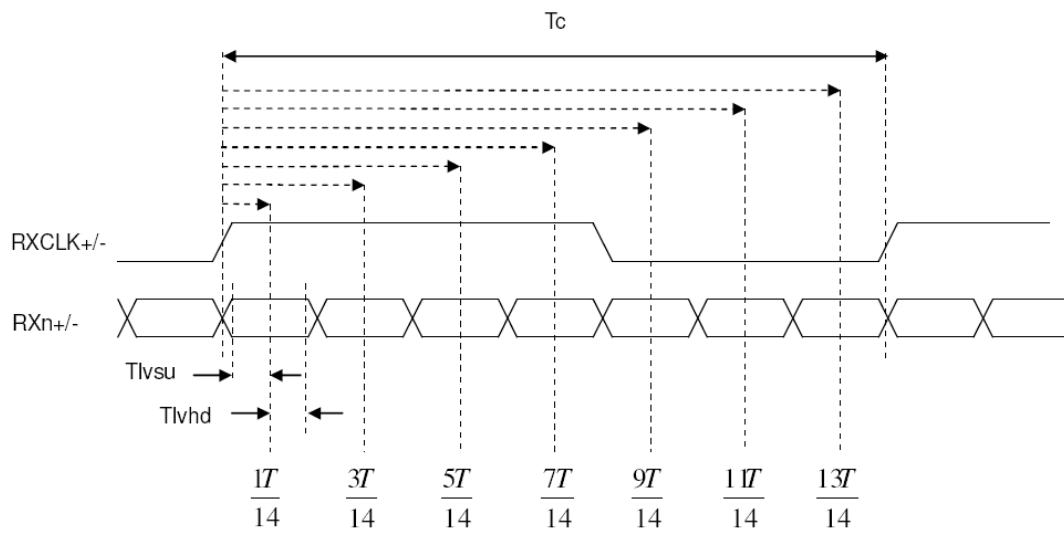


Note (4) The SSCG (Spread spectrum clock generator) is defined as below figures.



Note (5) The LVDS timing diagram and setup/hold time is defined and showing as the following figures.

LVDS RECEIVER INTERFACE TIMING DIAGRAM

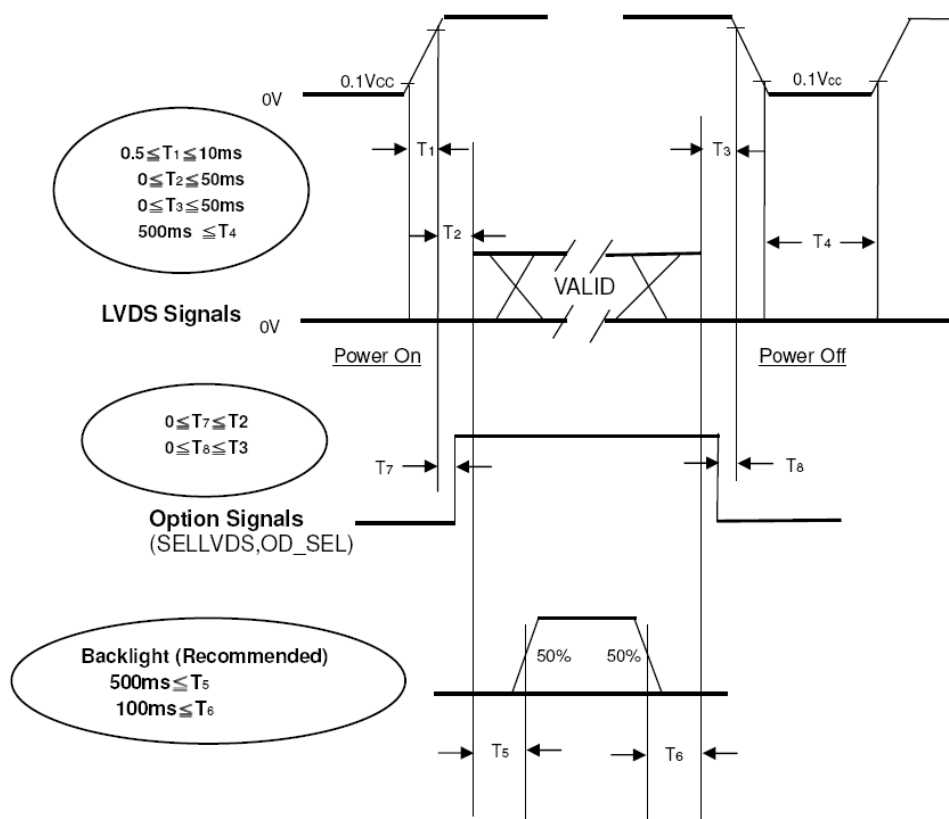


Note (6) : (ODSEL) = H/L or open for 50/60Hz frame rate. Please refer to 5.1 for detail information

POWER ON/OFF SEQUENCE

($T_a = 25 \pm 2^\circ\text{C}$)

To prevent a latch-up or DC operation of LCD module, the power on/off sequence should be as the diagram below.



Power ON/OFF Sequence

Note (1) The supply voltage of the external system for the module input should follow the definition of Vcc.

Note (2) Apply the lamp voltage within the LCD operation range. When the backlight turns on before the LCD operation or the LCD turns off before the backlight turns off, the display may momentarily become abnormal screen.

Note (3) In case of Vcc is in off level, please keep the level of input signals on the low or high impedance. If $T_2 < 0$, that maybe cause electrical overstress failure.

Note (4) T_4 should be measured after the module has been fully discharged between power off and on period.

Note (5) Interface signal shall not be kept at high impedance when the power is on.

6.0 OPTICAL CHARACTERISTICS

TEST CONDITIONS

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 45 minutes in a dark environment at 25. The values specified are at an approximate distance 50cm from the LCD surface at a viewing angle of Φ and θ equal to 0° .

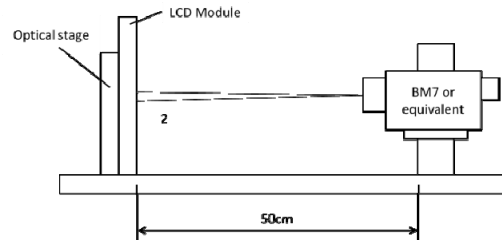


FIG. 1 Measurement Set Up

Optical Specifications

Item		Symbol	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR _n	-	5600	-	-	[1]
Luminance of White		L _{Ave}	1800	2000	-	cd/m ₂	[2]
Uniform		Lu	-	80	-	%	
Response Time		τ _{DRV}	-	6.5	-	ms	[3]
Chroma tivity	Red	R _x	Typ.-0. 03	0.640	Typ.+0 .03	-	[4]
		R _y		0.330		-	
	Green	G _x		0.316		-	
		G _y		0.634		-	
	Blue	B _x		0.147		-	
		B _y		0.047		-	
	White	W _x		0.314		-	
		W _y		0.348		-	
Viewing Angle	x axis, right(φ=0°)	θ _r	-	88	-	Degree	-
	x axis, left(φ=180°)	θ _l	-	88	-		
	y axis, up(φ=90°)	θ _u	-	88	-		
	y axis, down (φ=0°)	θ _d	-	88	-		

Note:

1. Contrast Ratio(CR) is defined mathematically as :Surface Luminance at all white pixels CR = Surface Luminance at all black pixels. It is measured at center 1-point.
2. Surface luminance are determined after the unit has been 'ON' and 1Hour after lighting the backlight in a dark environment at $25 \pm 2^\circ\text{C}$. Surface luminance is the luminance value at center 1-point across the LCD surface 50cm from the surface with all pixels displaying white. For more information see the FIG. 2.
3. The output signals of photo detector are measured when the input signals are changed for "White" to "Black" (falling time) and from "Black" to "White" (rising time), respectively. The response time Interval is between 10% and 90% of amplitudes, see the FIG.3.
4. Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined on the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD module surface. For more information, see the FIG. 4.

Measuring point for surface luminance & measuring point for luminance variation.

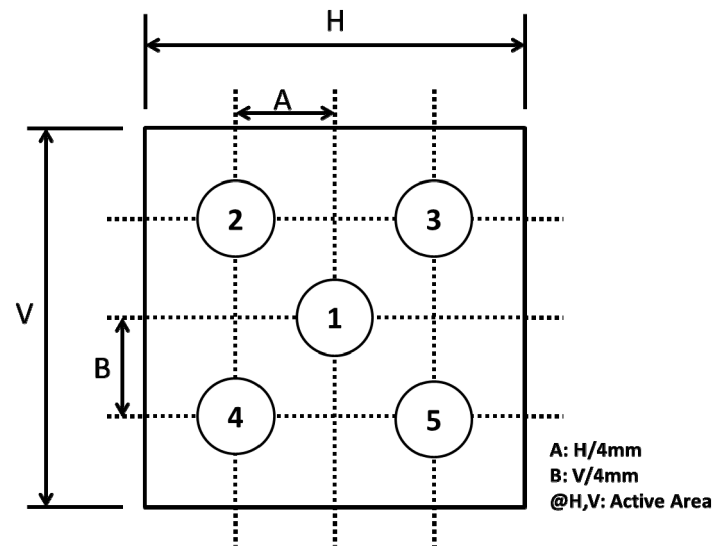


FIG. 2 5 Points for Luminance Measure

Response time is defined as the following figure and shall be measured by switching the input signal for “White” and “Black”.

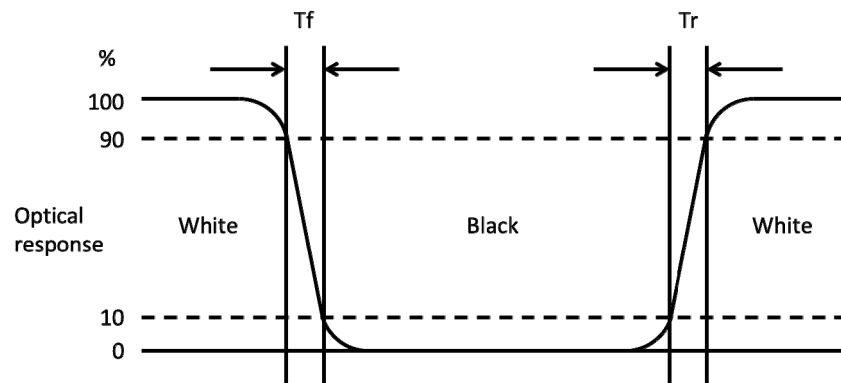


FIG. 3 Response Time

Definition for viewing angle

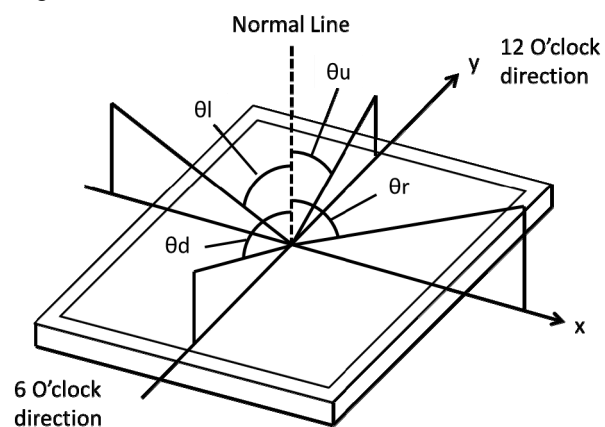


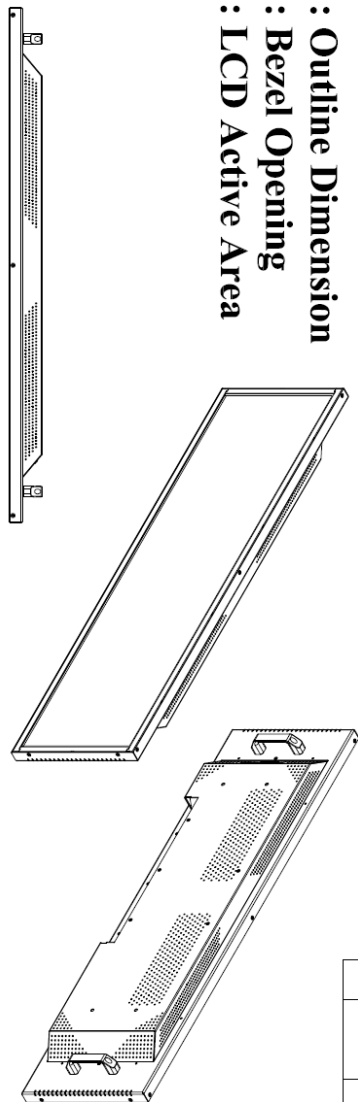
FIG. 4 Viewing Angle

SSD3840-V2 MECHANICAL SPECIFICATION

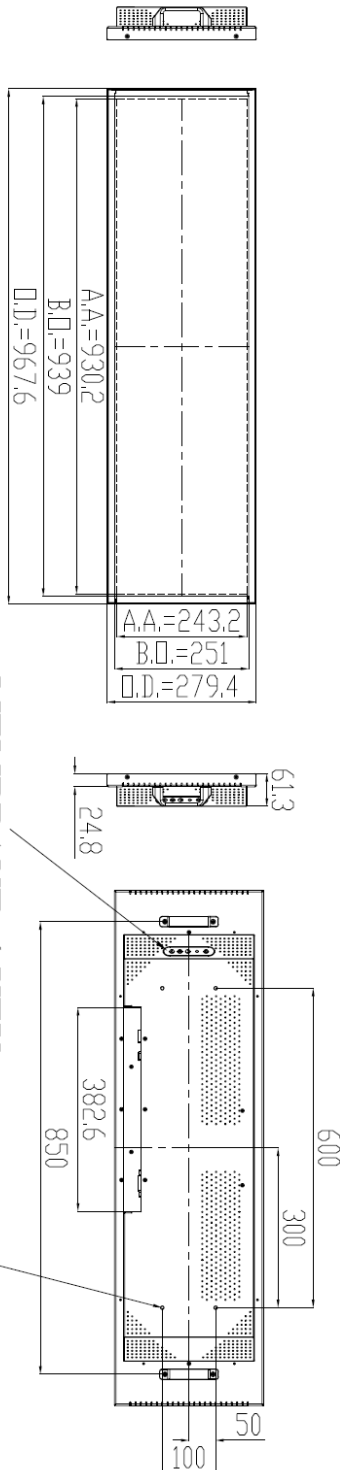
Item		Min.	Typ.	Max.	Unit
Module Size	Horizontal(H)	-	967.6	-	mm
	Vertical(V)	-	279.4	-	mm
	Depth(D)	-	61.3	-	mm
Weight (Module only)		-	10.5	-	kg
Weight (1 module per box)		-	21	-	kg

Note :

O.D. : Outline Dimension
B.O. : Bezel Opening
A.A. : LCD Active Area



REV	ECN NO.	DESCRIPTION	SIGN	DATE
1		Design Drawing	Jerry_Zhong	2013/03/29



MEMBRANE 4-KEY

4-M6 SCREW

Max Depth = 12 mm

AC 100~240V-

VGA

APPROVED	CHECKED	DESIGNED	LEVEL					MATERIAL
			GENERAL	TOLERANCE	FINISH	DATE		
			DIM.	1	2	3 SELECT		
			0 = 4	0.05	0.1	0.1	LEVEL	
			4 - 14	0.05	0.1	0.1		
			14 - 63	0.05	0.1	0.2		
			63 - 250	0.1	0.2	0.3		
			250 - 630	0.2	0.3	0.5		
			630 - 1600	0.3	0.5	0.8		
			1600 - 4000	0.5	0.8	1.0		

	(M) SERIAL NO PART ID	RS-SSD 3840-ENB-G2L
	MFG DATE DIMENSION	
	DESCRIPTION	SPE 200MMx1970X62 LITEXA ADP66GCD/DI/CALCUL DIRMING A(CO=24V) IMPACT IN LV
Litemax	Litemax Electronics Inc	SIZE SHFT KEY XT A4 I-1 X1

8.0 PRECAUTIONS

HANDLING PRECAUTIONS

- (1) The module should be assembled into the system firmly by using every mounting hole. Be careful not to twist or bend the module.
- (2) While assembling or installing modules, it can only be in the clean area. The dust and oil may cause electrical short or damage the polarizer.
- (3) Use fingerstalls or soft gloves in order to keep display clean during the incoming inspection and assembly process.
- (4) Do not press or scratch the surface harder than a HB pencil lead on the panel because the polarizer is very soft and easily scratched.
- (5) If the surface of the polarizer is dirty, please clean it by some absorbent cotton or soft cloth. Do not use Ketone type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanently damage the polarizer due to chemical reaction.
- (6) Wipe off water droplets or oil immediately. Staining and discoloration may occur if they left on panel for a long time.
- (7) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contacting with hands, legs or clothes, it must be washed away thoroughly with soap.
- (8) Protect the module from static electricity, it may cause damage to the C-MOS Gate Array IC.
- (9) Do not disassemble the module.
- (10) Do not pull or fold the lamp wire.
- (11) Pins of I/F connector should not be touched directly with bare hands.

STORAGE PRECAUTIONS

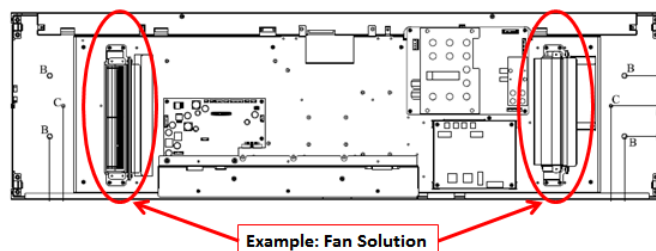
- (1) High temperature or humidity may reduce the performance of module. Please store LCD module within the specified storage conditions.
- (2) It is dangerous that moisture come into or contacted the LCD module, because the moisture may damage LCD module when it is operating.
- (3) It may reduce the display quality if the ambient temperature is lower than 10 °C. For example, the response time will become slowly, and the starting voltage of lamp will be higher than the room temperature.

OPERATION PRECAUTIONS

- (1) Do not pull the I/F connector in or out while the module is operating.
- (2) Always follow the correct power on/off sequence when LCD module is connecting and operating. This can prevent the CMOS LSI chips from damage during latch-up.

THERMAL PRECAUTIONS

- (1) SSF/SSH3840 with 2000nits is LCD SKD without cooling system, and it's easy to cause overheating. If you ordered SSF/SSH3840, please devices good ventilation inside your enclosure for fear of damaging by overheating.



9.0 AD2662GDVAR Board & OSD Functions

AD BOARD GENERAL SPECIFICATIONS

- Max Resolution Up To Full HD 1920x1080
- Analog RGB Input
- ULTRA-RELIABLE DVI INPUT
- CBVS, S-VIDEO, Ycbcr INPUT (optional)
- 1.5Wx2 Audio Out
- Dual/single LVDS interface
- Support Panel DC5V or 3.3V, 12V Output
- Automatic External Fan Control
- OSD Control
- Inverter 0~5V Dimming Control
- *External V.R. brightness control (optional)
- *External light sensor brightness control (optional)
- *External RS232 control (optional)
- Input Power 12Vdc

SUPPORTED TIMING (*by your panel resolution)

The following table displays optimum quality modes that the LCD monitor provides. If the other video modes are used, the monitor will stop working or display a poor quality picture.

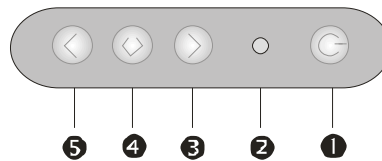
TIMMING	
MODE	RESOLUTION
VGA	640x480@60Hz
	640x480@72Hz
	640x480@75Hz
SVGA	800x600@56Hz
	800x600@60Hz
	800x600@72Hz
	800x600@75Hz
XGA	1024x768@60Hz
	1024x768@70Hz
	1024x768@75Hz
SXGA	1280x1024@60Hz
	1280x1024@70Hz
	1280x1024@75Hz
WXGA	1366x768@60Hz

WSXGA+	1680x1050@60Hz
SXGA+	1400x1050@60Hz(Pixel f 101.000MHz)
	1400x1050@60Hz(Pixel f 121.750MHz)
	1400x1050@75Hz
UXGA	1600X1200@60Hz
	1600x1200@65Hz
	1600x1200@75Hz
FHD	1920X1080@60Hz
	1920X1080@65Hz
	1920X1080@75Hz

unit: mm



MEMBRANE CONTROL BUTTON



- ❶ **POWER SWITCH:** Pushing the power switch will turn the monitor on. Pushing it again to turn the monitor off.
- ❷ **Power LED:** Power ON-Green / Power off-No.
- ❸ **Up Key >:** Increase item number or value of the selected item.
- ❹ **Menu Key:** Enter to the OSD adjustment menu. It also used for go back to previous menu for sub-menu, and the change data don't save to memory.
- ❺ **Down Key <:** Decrease item number or item value when OSD is on.
When OSD is off, it is hot key for input switch between VGA, AV, and S-video.

Screen Adjustment Operation Procedure

1. **Entering the screen adjustment**
The setting switches are normally at stand-by. Push the **Menu Key** once to display the main menu of the screen adjustment. The adjustable items will be displayed in the main menu.
2. **Entering the settings**
Use the **Down Key <** and **Up Key >** buttons to select the desired setting icon and push the SELECT button to enter sub-menu.
3. **Change the settings**
After the sub-menu appears, use the **Down Key <** and **Up Key >** buttons to change the setting values.
4. **Save**
After finishing the adjustment, push the SELECT button to memorize the setting.
5. **Return & Exit the main menu**
Exit the screen adjustment; push the "MENU" button. When no operation is done around 30 sec (default OSD timeout), it goes back to the stand-by mode and no more switching is accepted except MENU to restart the setting.

OSD FUNCTIONS

Here are some instructions for you to use the OSD (On Screen Display). By pressing the “menu”, you will see the below picture.

Timing shows resolution, H-frequency, and V-frequency of the panel. Version shows the firmware control version. This 2 information is not changeable by user.

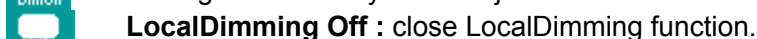
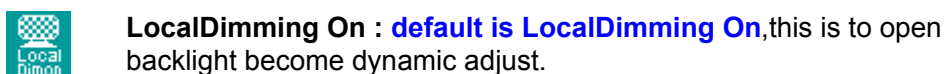
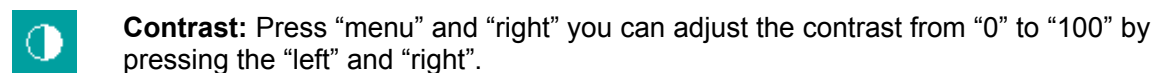
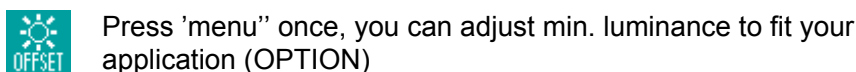
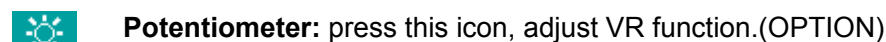
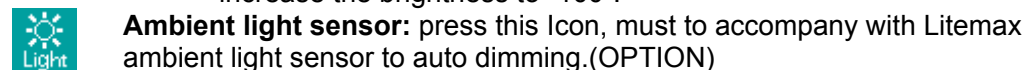
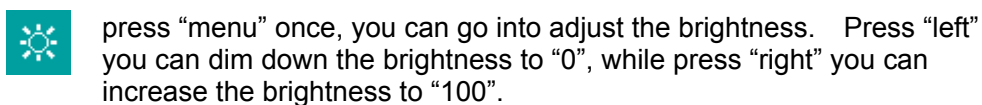


There are 7 sub pages inside the OSD manual, Brightness, Signal select, Sound, Color, Image, Tools, and Exit.

When you press “menu” button, you enter the “Brightness” sub page. You will see 5 selections:



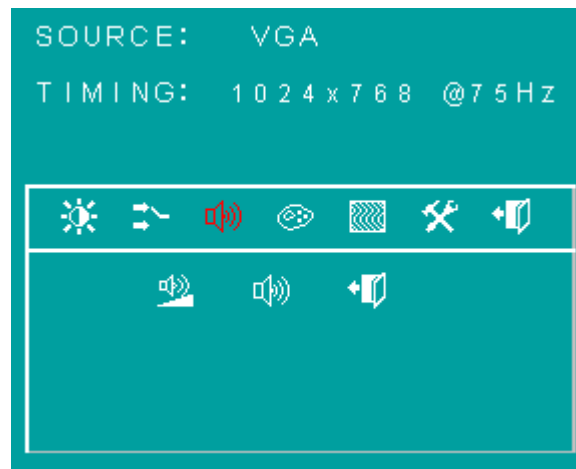
OSD Brightness:





Exit: You can exit this sub menu back to normal screen.

Sound :



There are 3 options for “Sound” sub page.



Audio Volume: Audio volume adjustment.



Mute: You can mute the speaker by pressing this option.



Exit: back to the normal screen.



Auto Color: by press this “Auto Color” option, you can get the optimal color performance.



sRGB: Windows standard color setting.



Color Tempture: You can have 3 options in this selection.



Color Tempture User



Color Tempture_6500K



Color Tempture_9300K

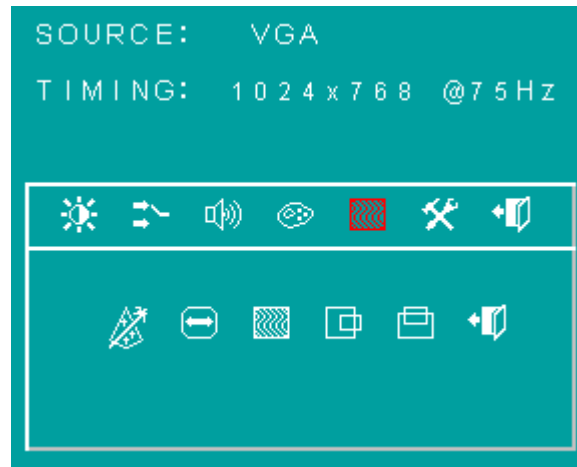
“user mode”, “6500K” (Warm color scheme), “9300K (Cold color scheme).
Def ault is “user”, and inside all “R”, “G”, and “B” are set “100”



Exit: back to the normal screen.

Image :

Go into the "Image" page, you can see below picture.



Auto just: Pressing this option, the AD5621 will adjust the optimal frequency of horizontal and vertical. You will see "Auto tune...." On the screen for around 3 seconds.



Clock: If you are not satisfied about the Autotune result, you can adjust manually by "Clock". The screen will be "wider" if you adjust this function.



Phase: If you see "double image" on characters, you can adjust "Phase" to make it perfect image.



HPos: You can shift the screen horizontally by this function.



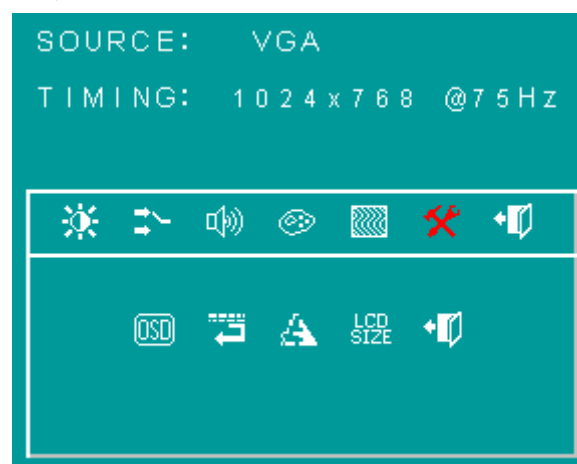
Vpos: You can shift the screen vertically by this function.



Exit: Back to normal screen.

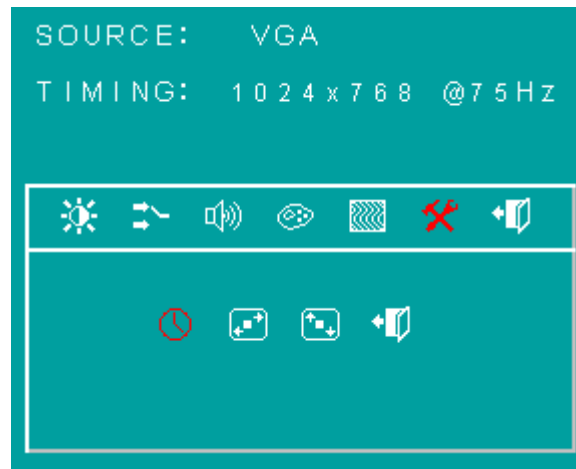
TOOLS :

On the "Tools" sub menu, you will see 5 icons.





Osd Control: Select this option, you will see 4 more options:



Osd_time: You can selection the time of OSD from 2 sec. to 16 sec. E



Osd_HPos: You can move the OSD horizontally over the screen.



Osd_VPos: You can move the OSD Vertically over the screen.



Exit: back to main menu.



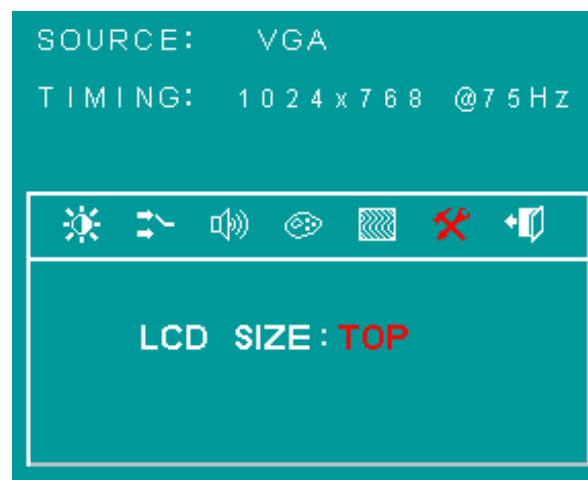
Factory_Reset: By pressing this, the screen will be back to the factory setting on very beginning and lost all the personal settings.



Sharpness: You can make the characters looks sharper.



LCD SIZE: Select this option, you can control LCD size 3 type, 1.Bottom mode , 2.Top mode, 3.Compress mode.



Exit

BURNIN MODE :

Factory Burn-in mode: While your VGA cable is connected on the monitor, press “Menu” and Left and Right <” simultaneously, you will see “BURN IN MODE” on the center of the screen for 3 sec. Then unplug the VGA cable, the screen will show Red, Green, Blue, White, and Black in sequence automatically.

You can plug in the VGA signal cable, and re-plug the power connector to exit the burn-in mode.

KEY LOCK MODE :

OSD Lock Function: It is possible to lock all the OSD buttons to prevent unauthorized changes to occur by pressing “Menu” and “right >” buttons simultaneously. You will see the “lock” icon below on the center of the screen for 3 seconds. If any button is pushed after the lock function is initiated, the below icon will appear on the screen.'



To release the OSD lock, press “Menu” and “Right >”. The below icon will appear on the center of the screen for 3 seconds. Now all OSD keys are active again.

